

***Amendments to the Drawings:***

The attached drawing sheet is a replacement sheet for originally filed FIG. 3. No new matter has been added.

Attachment: Replacement Sheet with FIG. 3

### ***REMARKS***

As a result of this Amendment, Claims 60-93, 106, 109, 110, 112-115, 117, 119 and 134-184 are pending in the subject application. Claim 87 is amended to address an issue noted in the Office Action. New claims 134-184 are added by the present amendment and are substantially in the same form as claims 60-93 and 104-120 presented in the published application, U.S. Patent Application Publication No. US 2008/0137871.

In the Office Action issued 16 February 2011 for the subject application ("Office Action"), claims 60-93, 106, 109, 110, 112-115, 117, and 119 were rejected on statutory grounds, described in further detail below. Additionally, the drawings of the application were objected to, as described in further detail below.

FIG. 3 is amended to include limitations of various of the claims, as described in further detail below. The amendments are supported by the original disclosure. No new matter has been added.

Based on the foregoing amendments and the following remarks, applicant requests reconsideration and further examination of the subject application.

### ***Drawings***

The drawings were objected to under 37 CFR § 1.83(a). The Examiner states that the drawings must show every feature of the invention specified in the claims. More specifically, the Examiner states that the following limitations should be shown in the drawings or the feature(s) canceled from the claim(s): "the difference between the summation signal and the difference signal, for a given frequency and level, conforms with the difference specified by the BTSC standard" as specified in claims 69, 78, 80, 82, 86, and 110 and similar language in claims 112-114; "the BTSC encoder has a frequency response in the digital domain that is substantially equal to the analog frequency response specified by the BTSC standard" as specified in claim 87; "the digital matrix has a frequency response in the digital domain that is substantially equal to the analog frequency response specified by the BTSC standard" as specified in claim 89 and the

similar language in claim 92; and “the digital signal processor has a frequency response in the digital domain that is substantially equal to the analog frequency response specified by the BTSC standard” as specified in claim 109.

In response, applicant notes that by the present amendment to the drawings, FIG. 3 is amended to show the noted limitations. The replacement sheet for FIG. 3 is marked as such and is in compliance with 37 CFR § 1.121(d). The amendments to the drawings are supported by the original disclosure, e.g., paragraph [0049] and original FIG. 3 and/or inherently. No new matter has been added. Thus, the objections to the drawings are believed to be overcome.

### ***Claim Rejections – 35 U.S.C. § 112***

Claims 87 and 115 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter that the Applicant regards as the invention. More specifically, the Examiner states that claim 87 included an incorrect description regarding placement of the difference channel processing section and the sum channel processing section. By the present amendment, claim 87 is amended to clarify that the digital BTSC encoder includes the difference channel processing section and the sum channel processing section. Thus, the rejection of claims 87 and 115 under 35 U.S.C. § 112, second paragraph, is believed to be overcome.

### ***Claim Rejections – 35 U.S.C. § 103***

Claims 69-71, 78-87, 89-93, 106, 109, 110, 115, 117 and 119 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,760,602 to Gibson *et al.* (“Gibson”) in view of Applicant’s Admitted Prior Art (“AAPA”) in the Background section of the subject application. Claims 60-68, 72-77, 88, and 112-114 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gibson and the AAPA, as described previously, and in further view of previously cited Crochiere *et al.* (“Crochiere”) (“Interpolation and Decimation of Digital Signals – A Tutorial Review”).

Without acceding to the propriety or correctness of the statements alleged in the Office Action for the noted rejections, applicant respectfully submits that Gibson, the AAPA, and Crochiere, whether considered individually or in any combination, do not teach or suggest all of the limitations of applicant's independent claims, as is explained below. Moreover, proper motivation is not believed to exist for the proposed modification of the teachings of the references, as will be explained. Thus, the requirements for a rejection under 35 U.S.C. § 103(a) are believed to be lacking in the present situation.

#### **A. Applicant's Priority Date**

As a preliminary remark, the applicant notes that the subject application claims priority to Application Serial No. 08/661,412 (now issued as U.S. Patent No. 5,796,842), which was filed 07 June 1996. The applicant provides this fact here for the purpose of reminding the Examiner of the proper time frame for obviousness considerations, e.g., from the perspective of a person of ordinary skill in the art as of the date of invention of the claimed subject matter, which is presumed to be the filing date of the earliest priority application, i.e., 07 June 1996.

#### **B. Failure to Disclose or Suggest All Claim Limitations**

Applicant respectfully submits that the prior art applied for the rejections under 35 U.S.C. § 103(a) fails to disclose or suggest all the limitations of applicant's respective claims.

For example, for the rejection of claims 69-71, 78-87, 89-93, 106, 109, 110, 115, 117 and 119, the Examiner cites Gibson as allegedly disclosing the following in relation to applicant's independent claim 86:

[A] BTSC processor for L-R signal at the transmitter (shown in Fig. 1A; col. 2, lines 56-60; col. 1, lines 52-54) and a BTSC processor at the receiver (shown in Fig. 1B). The adaptive weighting circuit could be implemented in analog or digital form (col. 8, lines 11-16). Thus, Gibson meets the claimed limitation as specified in B.

[Emphasis Added]

The primary reference, Gibson, discloses an analog variable preemphasis/deemphasis network for providing compression/expansion in a second audio program (SAP) or stereophonic television (L-R) signal channel for noise reduction. Gibson, col. 1, lines 5-9. applicant notes that FIGS. 1A-1B of Gibson noted by the Examiner for the rejection do not show any digital architecture but rather show only a prior art analog spectral compressor and expander respectively. See, Gibson, col. 2, lines 49-55.

The portion of Gibson cited for the rejection as allegedly disclosing “digital forms” actually states only the following:

The illustrated embodiments are implemented in continuous analog function. Such a filter could be implemented in either continuous or sampled data form. Sampled data implementations may be implemented in either analog or digital form.

[Emphasis added] (Gibson, col. 8, lines 11-16.)

Even though Gibson casually mentions that sampled data implementations may be implement in digital form, Gibson does not enable such digital implementations or describe a single digital embodiment with any specificity.

Continuing with the discussion of claim 86, the Examiner states the following:

Gibson fails to show the processor for L+R signal at the transmitter. However, BTSC encoder at the transmitter inherently includes processor for processing L+R signal. AAPA clearly illustrates a processor for processing L+R signal and another processor for processing L-R signal. As illustrated in AAPA, the processor for processing L+R signal is simpler than the processor for processing L-R signal. By using digital circuit for implementing a digital processor for processing L-R signal as suggested in Gibson, one skilled in the art could expect that a digital processor could be designed for processing L+R signal without undue experience [sic].

[Emphasis added]

As was noted by the applicant previously, Gibson discloses only analog embodiments of its spectral compressor and expanders, which operate (as the Examiner concedes) on only the L-R signal. Gibson’s sole comment that “[s]ampled data implementations may be implemented in

either analog or digital form” does not enable one skilled in the art to achieve applicant’s claimed invention; the AAPA does not remedy the deficiencies of Gibson.

The AAPA, including FIG. 1 and related text of the subject application, discloses a purely analog BTSC encoder system. The AAPA does not teach or suggest a digital BTSC encoder as recited in each of the claims under rejection. While the AAPA mentions that a digital BTSC encoder would potentially offer several advantages, the AAPA itself does not teach or suggest a digital BTSC encoder architecture and clearly states that many difficulties existed at the time the invention of the claimed subject matter, which is presumed to be when the original parent application was filed (i.e., 07 June 1996), for implementing such a digital encoder (described at paragraphs [0020]-[0021]):

[0020] While a digital BTSC encoder would potentially offer several advantages, there is no simple way to construct an encoder using digital technology that is functionally equivalent to the idealized encoder 100 defined by the BTSC standard. One problem is that the BTSC standard defines all the critical components of idealized encoder 100 in terms of analog filter transfer functions. As is well known, while it is generally possible to design a digital filter so that either the magnitude or the phase response of the digital filter matches that of an analog filter, it is extremely difficult to match both the amplitude and phase responses without requiring large amounts of processing capacity for processing data sampled at very high sampling rates or without significantly increasing the complexity of the digital filter. Without increasing either the sampling frequency or the filter order, the amplitude response of a digital filter can normally only be made to more closely match that of an analog filter at the expense of increasing the disparity between the phase responses of the two filters, and vice versa. However, since small errors in either amplitude or phase decrease the amount of separation provided by BTSC encoders, it would be essential for a digital BTSC encoder to closely match both the amplitude and phase responses of an idealized encoder of the type shown at 100 in FIG. 1.

[0021] For a digital BTSC encoder to provide acceptable performance, it is critical to preserve the characteristics of the analog filters of an idealized encoder 100. Various techniques exist for designing a digital filter to match the performance of an analog filter; however, in general, none of these techniques produce a digital filter (of the same order as the analog filter) having amplitude and phase responses that exactly match the corresponding responses of the analog filter. Ideal encoder 100 is defined in terms of analog transfer functions specified in the frequency domain, or the s-plane, and to design a digital BTSC

encoder, these transfer functions must be transformed to the z-plane. Such a transformation may be performed as a "many-to-one" mapping from the s-plane to the z-plane which attempts to preserve time domain characteristics. However, in such a transformation the frequency domain responses are subject to aliasing and may be altered significantly. Alternatively, the transformation may be performed as a "one-to-one" mapping from the s-plane to the z-plane that compresses the entire s-plane into the unit circle of the z-plane. However, such a compression suffers from the familiar "frequency warping" between the analog and digital frequencies. Prewarping can be employed to compensate for this frequency warping effect, however, prewarping does not completely eliminate the deviations from the desired frequency response. These problems would have to be overcome to produce a digital BTSC encoder that performs well and is not unduly complex or expensive.

[Emphasis added]

Further discussing claim 86, the Examiner states that the limitation defined in part D of the claim is "inherently met according to the BTSC standard that complies by [sic] Gibson and AAPA." Applicant takes this statement to mean that the Examiner asserts that the D limitation of claim 86 ("wherein the difference between the digital sum signal and the digital difference signal, for a given frequency and level, conforms with the difference specified by the BTSC standard") is met by Gibson and AAPA because both describe circuits/systems that comply with the BTSC standard. In response, applicant notes again that Gibson and the AAPA disclose analog BTSC circuits/systems and Gibson does not enable or describe with any specificity any actual digital embodiments. Thus, the "D" limitation of claim 86 is not disclosed or suggested by Gibson and/or the AAPA.

Regarding claims 87 and 115, the Examiner states that, compared to claim 86, the claimed system further includes a digital composite modulator. The Examiner then states that Gibson teaches a modulator (col. 2, lines 65+). Following this, the Examiner states the following:

As discussed in [sic] claim 86, the L+R signal and the L-R signal are digitally processed. L+R or the L-R signal is a digital composite signal. So the modulator used for modulating the digital L+R signal and the digital L-R signal could read on the claimed digital composite modulator.

[Emphasis added]

In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86 and further submits that the conclusion made for the rejection of claims 87 and 115 is based on hindsight analysis to an impermissible degree (as is explained in further detail below in Section C “Lack of Proper Motivation for the Rejection”), as neither Gibson nor the AAPA disclose or enable any specific digital processing or architecture.

Regarding claim 89, the Examiner states that the claim was similar to claim 86. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Regarding claim 90, the Examiner admits that Gibson and AAPA fail to show that the digital matrix unit, the difference channel processing unit, and the sum channel processing unit are included in a single integrated circuit. The Examiner alleges that it would have been obvious to one of ordinary skill in the art to modify the combination of Gibson and the AAPA to try placing the digital matrix unit, the difference channel processing unit, and the sum channel processing unit in a single integrated circuit in order to reduce the cost of the system and make a smaller system. (Office Action, page 6). In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86 and further submits that the conclusion made for the rejection of claim 90 is based on hindsight analysis to an impermissible degree, as neither Gibson nor the AAPA disclose or enable any specific digital processing or architecture.

Regarding claim 91, the Examiner admits that Gibson and AAPA fail to show that the digital matrix unit, the difference channel processing unit, and the sum channel processing unit are implemented by a DSP. The Examiner then states that Gibson suggest a general digital circuitry. The Examiner then takes Official Notice “that using a DSP to perform the digital processing function is notoriously well known in the art,” concluding that “it would have been obvious to one of ordinary skill in the art to further modify Gibson and AAPA by using well known DSP in order to program the DSP to perform the digitized encoding function.” (Office Action, page 6) In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86 and further submits that the conclusion made for the

rejection of claim 91 is based on hindsight analysis to an impermissible degree, as neither Gibson nor the AAPA disclose or enable any specific digital processing or architecture.

Regarding claims 69, 70, 78, 79, 80, and 81, the Examiner admits that Gibson fails to show a digital-to-analog converter arrangement. The Examiner then makes the following comments:

By digitally processing the L+R signal and the L-R signal, they are digitally encoded signals. Gibson teaches a general modulator (col. 2, lines 65+). A general analog modulator or a general digital modulator is well known in the art. With a general analog modulator, the digitally processed L+R signal and the digitally processed L-R signal have to be converted to analog format in order to be transmitted [sic] the analog modulator. That is, DACs are at the inputs of a general analog modulator. On the other hand, when using a digital modulator, a DAC at the output of the digital modulator, could be used to convert the modulated digital signal to [sic] analog signal. Examiner takes Official Notice that DAC is notoriously well known in the art. *Thus, it would have been obvious to one of ordinary skill in the art to further modify Gibson and AAPA by including well-known DAC in order to use the analog modulator to combine the digitally processed L+R signal and L-R signal, or using well-known DAC for converting the digitally modulated composite signal.*

[Emphasis added]

In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86 and further submits that the noted conclusion made for the rejection of claims 69, 70, 78, 79, 80, and 81 is based on hindsight analysis to an impermissible degree, as neither Gibson nor the AAPA disclose or enable any specific digital processing or architecture. Furthermore, applicant notes that each of claims 69, 70, 78, 79, 80, and 81 includes the limitations of “wherein the difference between the summation signal and the difference signal, for a given frequency and level, conforms with the difference specified by the BTSC standard” and the limitations that the summation signal and difference signal are digital signals. As was explained previously, neither Gibson nor the AAPA disclose or suggest such limitations.

Regarding claim 71, the Examiner states that the claimed “pre-selected sample rate” is inherently included in a digital signal. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Regarding claims 82, 83, and 85, the Examiner states that the limitation specified in the claims had been discussed for claim 86. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Regarding claim 84, the Examiner states that the claimed 75  $\mu$ s preemphasis is inherently included in the BTSC standard. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Regarding claim 92, the Examiner admits that “comparing with claim 87 discussed above, Gibson fails to show the matrix unit has a frequency response in the digital domain that is substantially equal to the analog frequency response specified by the BTSC standard.” The Examiner then states “[t]he AAPA discloses a matrix unit,” “[t]his matrix unit could easily be designed to generate a digital L+R signal and a L-R signal without undue experience,” and “[t]he frequency response of the of the digital matrix unit should be similar to the frequency response of the equivalent analog matrix in order to preserve the signal contents (sum and difference channels).” [Emphasis added] (Office Action, page 7) The Examiner then takes Official Notice that “this feature is notoriously well know in the art” and stated “[b]y using such matrix unit, the digital L-R signal could be processed by the digital processing unit as suggest in Gibson.” In response, applicant traverses the Examiner’s taking Official Notice and reiterates the rebuttal statements provided previously in response to the rejection of claim 86. Applicant further submits that the noted conclusion made for the rejection of claim 92 is based on hindsight analysis to an impermissible degree, as neither Gibson nor the AAPA disclose or enable any specific digital processing or architecture.

In addition, the applicant notes that at the time of applicant’s invention, i.e., as of the filing date of 07 June 1996 of the original priority document, applicant knows of no technology beyond the applicant’s was known to provide a frequency response in the digital domain that was compliant with the frequency response in the analog domain as specified by the analog BTSC standard. This is clearly described in the Background section of applicant’s specification. See paragraphs [0020]-[0021]. Thus, the applicant respectfully submits that the Examiner has failed

to keep the priority date of the subject application in mind when formulating the rejection of claim 92 as well as the other pending claims of the application.

Regarding claim 93, the Examiner states that the claimed frequency is an inherent feature of a BTSC broadcasting signal. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Regarding claims 106 and 117, the Examiner states that the limitations of the claims are similar to those in claims 86 and 87 with the exception of the adaptive signal weighting system configured to dynamically vary the phase of the digital difference signal, and the digital sum channel section comprising one or more digital filters for altering the phase of the digital sum signal. The Examiner then states that “*Gibson hints that the adaptive network for processing the difference signal would inherently vary the phase* (col. 2, lines 12-18).” [Emphasis added]

In response, Applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86. Further, the applicant respectfully takes issue with this statement concerning Gibson. What the cited portion of Gibson actually discloses is the following:

A major disadvantage of the circuit shown in the above article is that two signal filters, one with a transfer characteristic  $H(f)$  and the other with the complementary transfer characteristic, i.e.  $H^{-1}(f)$ , must be implemented. The two signal filters must be accurately matched to each other in terms of both amplitude and phase for the circuit to operate properly.

[Emphasis added]

The cited text of Gibson clearly does not “hint” or otherwise imply or state that an adaptive network processing the difference signal would inherently vary the phase. In fact, the transfer functions (or characteristics) described by Gibson in the cited text do not reference or rely on phase at all. Further, the noted transfer functions are not described by Gibson as affecting phase in any way. Regarding phase, the cited text of Gibson discloses only that the two signal filters, one with a given transfer characteristic and the other with the inverse transfer characteristic, “must be accurately matched.” Gibson, col. 2, lines 17-18.

Regarding claims 109 and 119, the Examiner states that the limitations in the claims are similar to those in claims 86 and 87 with the exception that the digital signal processor has a frequency response in the digital domain that is substantially equal to the analog frequency response specified by the BTSC standard. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Regarding claims 110, the Examiner states only that it is similar to claim 109. In response, applicant reiterates the rebuttal statements provided previously in response to the rejection of claim 86.

Crochiere, is relied on as a tertiary reference for the rejection of claims 60-68, 72-77, 88, and 112-114 and is a tutorial review of interpolation and decimation of digital signals. Without acceding to the Examiner's characterizations of Crochiere, the reference is not understood as remedying the previously noted deficiencies of Gibson and the AAPA with respect to applicant's rejected claims. It is submitted that if one skilled in the art studied applicant's statement regarding the AAPA and the disclosure of Gibson and Crochiere, the combination lacks the suggestions and teachings on how to implement a digital BTSC compatible device as defined by applicant's claims 60-68, 72-77, 88, and 112-114.

In summary, none of the applied prior art in any combination is believed to teach or suggest the limitations of applicant's independent claims as listed herein.

### ***C. Lack of Proper Motivation for the Rejection***

In addition to the failure of the applied prior art to teach or suggest all of the limitations of the applicant's independent claims of the application, it is submitted that proper motivation does not exist to combine and/or modify the applied prior art in the way the Examiner has done for the rejections under 35 U.S.C. § 103(a).

As alleged motivation to combine and modify the teachings of Gibson and the AAPA for the rejection, the Examiner states for the rejection of claim 86 "[t]hus, it would have obvious to one of ordinary skill in the art to combine Gibson and AAPA by designing a digital processor for

L+R signal and a digital processor for L-R signal in order to process both the L+R signal and the L-R signal in digitized form." (Office Action, page 5). Applicant respectfully traverses such a statement and submits that it is conclusory and based on an improper degree of hindsight analysis.

Assuming for the sake of argument that the AAPA and Gibson are combined and modified as proposed for the rejection, such a combination/modification would fail to achieve applicant's claimed subject matter. The teachings of the references do not disclose any digital architecture and do not disclose any specific digital methods. Again, for the proper context of measuring the state of the art at the time the invention was made, the Examiner's attention is drawn to the priority date of the subject application (i.e., 07 June 1996) and the portions of the AAPA that describe the problems with prior art attempts to implement a digital encoder. See, e.g., paragraph [0022] of the subject application, which reads in part "none of these techniques produce a digital filter (of the same order as the analog filter) having amplitude and phase responses that exactly match the corresponding responses of the analog filter."

Therefore, the applicant respectfully submits that the rejection of the applicant's claims under 35 U.S.C. § 103(a) is based on impermissible hindsight analysis. Applicant understands that "[a]ny judgement [sic] on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." MPEP § 2145 (X)(A) (quoting *In re McLaughlin* 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971)). But because the combination of Gibson and the AAPA, with or without Crochiere, fails to disclose, suggest, and/or enable all of the limitations of applicant's claims, it is believed that the instant rejection employs hindsight analysis to a degree not consistent with the holding of *In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971). Thus, proper motivation is believed to be absent for the rejection of the claims under 35 U.S.C. § 103(a).

Accordingly, Gibson and the AAPA, with or without Crochiere, form an improper basis for a rejection of claims 60-93, 106, 109, 110, 112-115, 117, and 119 under 35 U.S.C. § 103(a). applicant, therefore, requests withdrawal of the rejection and allowance of the claims.

The other claims currently under consideration in the application are dependent from their respective independent claims discussed above and therefore are believed to be allowable over the applied references for at least similar reasons. Because each dependent claim is deemed to define an additional aspect of the invention, the individual consideration of each on its own merits is respectfully requested.

The absence of a reply to a specific rejection, issue, or comment does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be other reasons for patentability of any or all claims that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede, or an actual concession of, any issue with regard to any claim or any cited art, except as specifically stated in this paper, and the amendment or cancellation of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment or cancellation.

### ***Conclusion***

New claims 134-184 are added by the present amendment and are substantially in the same form as claims 60-93 and 104-120 presented in the published application, U.S. Patent Application Publication No. US 2008/0137871. New claims 134-184 are believed to be patentable for similar reasons as for the corresponding previously presented claims.

In view of the foregoing, the applicant submits that the claims are now in condition for allowance and respectfully requests a notice to this effect.

Should the Examiner have any questions, please call the undersigned at the phone number listed below.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made for this paper or any future papers for the subject application. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 501133 and please credit any excess fees to such deposit account.

Respectfully submitted,

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